AMENDMENTS TO THE SPECIFICATION

Please replace Paragraph [0003] with the following paragraph rewritten in amendment format:

[0003] Present day brush commutated electric motors include an armature having a plurality of coils wound in slots formed in the lamination stack of the armature. With traditional motor designs, the lamination stack of the armature forms a plurality of circumferentially arranged slots extending between adjacent pairs of lamination posts. Typically, two coils per slot are used when winding the armature coils on the lamination stack. Among the two coils of the same slot, the one which commutates first is referred to as the first coil and the one which commutates second as the second coil. The second coil has inherently poorer magnetic commutation than the first coil because the second coil passes beyond the magnetic neutral zone within the stator before it finishes commutation. This is illustrated in simplified fashion in Figure 1, wherein the commutation [zone] region of the first coil is designated by Z_1 and the [commutator] commutation region [zone]of the second coil is designated by Z_2. A rotor "R" is shown positioned [at the mid-point of the first coil commutation zone] within a stator "S" having field coils "F". This is further illustrated in Figures 1a-1f. Figures 1a and 1b illustrate the position of the magnetic axis of the first and second coils, respectively, relative to the commutation regions Z_1 and Z_2 of each coil. Figures 1c and 1d illustrate the position of the magnetic axis of each of the first and second coils, relative to the field pole and brush, at the start of commutation of each coil. The magnetic axis of the first coil, in this example, is retarded about 22.5 degrees from the axis of the field pole and the brush (Figure 1c), while for the second coil, its magnetic axis is only retarded about 7.5

degrees relative to the field pole and brush (Figure 1d). Figure 1e shows the angular position of the magnetic axis of the first coil, relative to the field pole, when the first coil ends commutation. Figure 1f shows the angular position of the magnetic axis of the second coil, relative to the field pole and brush, when the second coil ends commutation. The angular position of the second coil, when it ends commutation, is clearly past the angular position, relative to the field pole, at which the first coil ends its commutation. The two regions Z_1 and Z_2 are not commonly angularly aligned (i.e., coincident) relative to the field pole and brush. As a result, the second coil commutation can generate significant brush arcing, and becomes the dominant source of the total brush arcing of the motor. This can also cause electro-magnetic interference (EMI) to be generated which exceeds acceptable levels set by various government regulatory agencies. This brush arcing can also lead to accelerated brush wear.

Please add new paragraphs 12.1 and 16.1 as follows:

[0012.1] Figures 1a-1f illustrate a prior art winding pattern showing how two coils of a coil pair produce non-coincident commutation regions;

[0016.1] Figures 5a-5c and 6a-6c illustrate the angular positioning of the resultant magnetic axis of each coil of a given coil pair, relative to the position of the commutator bars to which the coils are attached, at the start of commutation, at the end of commutation, and at an intermediate point during commutation;

Please replace Paragraph [0024] with the following paragraph rewritten in amendment format:

[0024] The above-described winding pattern significantly improves the commutation performance of all of the second coil portions of the coils 25. Splitting

each coil 25 into first and second subcoil portions allows each first subcoil portion to shift its magnetic axis away (i.e., laterally), from the position it would have otherwise had in a traditional two-coil-per-slot. This is illustrated in [Figure 5. All of the first subcoil portions shift their magnetic axes forward to produce a first coil commutation zone, as indicated by region 30, and all of the second subcoil portions shift their magnetic axes backward to produce a second coil commutation zone, as indicated by region 32, in reference to the armature's 10 rotational direction. Both of these commutation zones are now in a common, overlapping angular region with respect to the field coils 34, as shown in Figure 5.] <u>Figures 5a-5c and Figures 6a-6c</u>. <u>These figures each show a coil consisting of two series connected subcoils of unequal turns as disclosed previously. Each subcoil has a magnetic axis as shown. The resultant magnetic axis of the complete coil resides between the magnetic axes of the subcoils, but it is closer to the larger of the two. In Figures 5a and 6a, the orientation of the resultant magnetic axis of each of coils 1 and 2 (25_1 and 25_2) can be seen to fully overlap, as evidenced by the alignment of commutation regions 30 and 32 for each of the two coils 1 and 2.</u>

Please add and amend the following paragraphs.

<u>[0024.1] In Figures 5b and 6b, each of coils 1 and 2 are shown at the beginning of commutation. In Figure 5b, the resultant magnetic axis of coil 1 is shifted laterally to the right in the drawing figure due to the weighting of the turns of the two subcoil portions of coil 1. Its resultant magnetic axis aligns with the beginning of commutation region 30 of coil 1 as indicated by the vertical line 36. In this example, the resultant magnetic axis of coil 1 is advanced 15 degrees, or one-half the width of the</u>

commutation region 30. The axis of the field pole can be seen to fall at the center of brush 40. In Figure 6b, the resultant magnetic axis of coil 2 is shifted laterally to the left due to the weighting of the two subcoil portions of coil 2. The resultant magnetic axis of coil 2 thus also aligns with vertical line 36 at the beginning of commutation of coil 2. As such, both of coils 1 and 2 begin commutation at the same angular point (i.e., represented by line 36) relative to the axis of the field pole and the brush 40.

[0024.2] In Figures 5c and 6c, each of coils 1 and 2 are shown at the end of their respective commutation regions 30 and 32. In Figure 5c, the resultant magnetic axis of coil 1 is indicated by the vertical line 38. In Figure 6c, the resultant magnetic axis of coil 2 falls at the same angular position as coil 1, as also indicated by vertical line 38. Commutation regions 30 and 32 fully overlap one another, as evidenced in Figures 5b,6b and 5c,6c, and are in a common overlapping region with respect to the field coil 34 shown in Figure 5.

[0024.3] Further, it can be seen by examining Figures [4 and] 5, 5a-5c and 6a-6c that [these] the commutation [zones] regions 30 and 32 are also in a common angular position with respect to the commutator bars 12 to which the coils are connected. With a turns ratio between the two subcoils of about 3:1, this winding pattern smoothes out the magnetic "unevenness" between adjacent coils, which is a drawback with traditional two-coil-per-slot winding patterns. This, in connection with the shifting of the resultant magnetic axes of each coil, serves to significantly improve the commutation efficiency of the motor and to reduce the overall brush arcing.